3

SURGERY IN BENGAL:

AN ADDRESS TO THE BENGAL BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

BY J. FAYRER, M. D., F. R. S. E., & F. R. C. S. E.,

PROFESSOR OF SURGERY, MEDICAL COLLEGE, AND SURGEON MEDICAL COLLEGE HOSPITAL.

SURGEON, BENGAL ARMY.

AT THE ANNUAL MEETING, 14TH FEBRUARY 1865,

CALCUTTA.

Mr. President and Gentlemen—I know not how I can better fulfil the duty which has been assigned to me, of giving the first address in Surgery to the Bengal Branch of the British Medical Association, than by endeavouring to say something on the state of that Department of Medical Science as it exists on this side of India in the present day. I therefore propose to notice briefly the subject of Surgery in India, adverting specially to such points as appear to be of peculiar interest.

I confess that, in making this proposition, I undertake a matter which I feel fully conscious I am inadequate to do justice to, did even the time itself admit of the comprehensive consideration of so large a question. Yet, I trust I shall be able to show that Surgery and Surgical Pathology have not suffered in the hands of Indian Surgeons.

It is true that, as the labours of our profession lie scattered over a wide extent of country, much of what is done is known but to Official Records, or appreciated only by those who have reaped the benefits these labours have conferred. But it cannot be that such large experiences are always to remain unnoticed, or lie buried among the records of the past. In the present enlightened and advancing state of pathological enquiry, they must be made contributive to that progressive

knowledge, of which I would fain hope to see this Association the exponent.

It appears to me remarkable how little the subject of Surgery in India has attracted attention in the West, how little seems to have been drawn from a mine so rich in produce. This may be, no doubt, to a great extent attributed to the isolated and scattered position of the medical men in this great country, and to the paucity of Indian Journals on Medical Science in which they might make their labours known. But yet no one can turn to the pages of the Journal of the late Medical and Physical Society of Bengal, the "Pathologia Indica" of the late lamented Allan Webb, or the works of Brett, Martin, Twining, Chevers, Morehead, Carter, and others, as well as to the "Indian Annals of Medical Science," or the Journals of Madras and Bombay, without being convinced that India has fairly contributed its share to the Annals of Surgery and Pathology.

And this, indeed, is not more than should be expected; for to few have been given the like opportunities of dealing with disease, surgical or medical, on so large a scale, as to the British Surgeons who have spent their best years and energies in India, or to those native gentlemen who have so thoroughly grasped the Science of Medicine, as it is taught in Europe, and who have learned to practise with success the boldest operations in surgery.

Isolated, cut off from professional communion with his fellows, deprived of that stimulus of contact and intercourse, which is so essential to the growth of scientific knowledge, especially in a profession like ours, where so much depends on observation and interchange of our ideas with those of others, no wonder if the young surgeon, in the midst of a large experience, should have failed sometimes to profit to the fullest extent by his great advantages; to the extent, that is to say, he would have done, had he been in a position to talk over his cases and compare his ideas with those of his professional brethren.

Such is but too frequently the case with both Native and European Surgeon in the Mofussil of India, and such, no doubt, is the reason why so little is known of his work. And still much has been done, and is doing, as I hope to show;

and had my address no other result than that of directing attention to this subject, I should think it had fulfilled a good purpose.

By the kindness of the Medical Authorities I have been enabled to collect some interesting matter in a statistical form, illustrative of the extent to which Surgery is practised in India; and I feel sure that, whether for the amount of suffering relieved, or the extent of valuable information contributed to science, you will agree with me that it is not less interesting than valuable, and that it is, moreover, highly suggestive of the vast acquisitions that might be made to our Pathological and Surgical knowledge, were the details more thoroughly known, and the records of many years analysed.

Most of my hearers, I suppose, are familiar with the standard works of Europe, at all events of Britain, on Surgery; most of them, no doubt, are acquainted with the writings of modern Surgeons and Pathologists, on the more interesting subjects connected with those Sciences; and yet I will venture to say that you would have difficulty in adducing even a casual reference, in any of the standard works professing to treat exhaustively of their respective subjects, to the authority, practice, or opinion of one Indian Surgeon.

Let us take the operation of lithotomy, for example. The most elaborate description of all points, pathological, anatomical, chemical, or surgical, concerned in the disease for which this operation is performed; the fullest details, statistical and descriptive, of the proceedings and opinions of British and Continental Surgeons of eminence, who have been interested in, or distinguished for, their investigation or skill in operating for this grievous disease; every fact, in short, that could be collected, carefully collated and recorded, yet, not a word on the subject as it relates to India, where we count our operations by hundreds, I may say, and where some of our graduates have cut as many men successfully for stone as the greatest lithotomists Europe ever saw.

Let me not be charged with exaggeration; I may refer to my friend Baboo Ram Narain's experience, who, within a period of 12 years, in the Stations of Cawnpore and Budaôn, operated upwards of 200 times with a loss of 7 cases. Or,

as an equally good illustration of the opportunities afforded, and the mode in which they are taken advantage of, I might adduce a recent donation of 17 large vesical calculi, presented to the College Museum by a graduate whose degree is not yet a year old, removed by him, at the station of Pind Dadun Khan, within six months after joining his appointment.

And I might refer to the names of O'Shaughnessy, Brett, Webb, Playfair, Naismith, Aitcheson, Partridge, Cayley and others, as of Surgeons who have had experience in this operation, that scarcely the Frére Jaques, Rau, or Cheselden ever exceeded.

If you will bear in mind the details I give you from the Official Records, you will see that though little may have been said on the subject, much really has been done. And as in the case of lithotomy, so it is in other matters surgical; the scrotal tumours, for example, of which the Hospitals in Lower Bengal record operations by the score. Tumours of vast magnitude removed with safety and celerity in a few minutes, the important parts involved being preserved and uninjured—a strange contrast to the descriptions still to be read in standard works on Surgery, of protracted and dangerous operations, involving, not only loss of parts, but sometimes of life. Though here I should remark, the operation has been recently performed by a Surgeon in England in the method recommended by Indian Surgeons, among the earliest of whom was, I believe, the late Surgeon Brett.

Now, it is not for the purpose of animadverting on others that I say this, for to do so would be unjust; but rather to put it before you how desirable it is that we should assert for ourselves a more prominent position in the published records of our science and give our experiences to the world.

It is to a Society like that I am now addressing, that we should look for the removal of this reflection on our professional zeal; it is here, or in the pages of the Journal which I hope ere long will be published, that we may hope to hear, or read, valuable matter discussed, and thus preserved from oblivion. To me, the interest and importance of this Society have always presented themselves from the highest point of view, and I most earnestly call upon our native professional brethren to give it their support, not only by their subscriptions and presence at the meetings, but by the contribution

and free discussion of their experiences. The Association is interesting to us all, but, if any thing, it should be of surpassing interest to them, as an indication of rapidly advancing enlightenment, a prominent bulwark against traditional superstition and ignorance. I most sincerely trust that it will become a worthy rival of its sister branches in Europe, and that in all matters pertaining to Indian Medicine, Surgery, Pathology, and Sanitation, its voice may be heard and respectfully regarded.

Before alluding to the present state of Surgical Science, it is right to refer to what it was, say less than half a century ago. Of this an admirable picture has been given by Dr. Chuckerbutty in his address to the Association last year. He says, "such was the state of the Medical profession immediately prior to the foundation of the Calcutta Medical College. The Native members of it were all unqualified men, totally ignorant of the modern sciences, and, if learned at all, it was merely in the ancient lore of the Hindu and Mahomedan schools, which taught no human anatomy, physiology, or chemistry, and were replete with errors and fanciful views of all kinds in their pathology and therapeutics. The European members of it almost all belonged to the Government service, and wrote and spoke in a foreign tongue, which, from the number of technical terms they made use of, presented formidable difficulties to all uninstructed persons." And to this I would refer you, for it shows plainly the rapid strides that have been made during the past thirty years, or, I may say, since the foundation of the Medical College, an Institution which has, I believe, done more real good, and more truly advanced the interests of the people generally, than any other branch of secular education that we have introduced. And yet it is not more due to the devotion and energy of the British Surgeons who originated and developed the School and Medical education to what we now see them, than to the enlightened native gentlemen who have had the courage and good sense to avail themselves of the intellectual benefits thereby offered, that the present widely spread knowledge of medicine and surgery has been attained. Much has been, and, as I believe, much is being done towards further progress; and I trust the time is not far distant when we shall see the results in the productions of original thought and research.

Previous to the foundation of the Medical College in 1833 by Lord W. Bentinck, many distinguished British Surgeons had lived and practised in Bengal. As to their names, or the influence that our profession has exercised, from the earliest periods of our connection with India, it is not my duty now to speak, yet we can hardly pass in silence the memorable, though I fear but too little known names of Broughton and Hamilton, to whom, indeed, we may say it is due that we have ever been here at all to spread the knowledge of European Surgery in India. It is rather to that period I would refer which dates from 10th January 1836, when the learned Pundit Moodhoosudhun Goopto, who taught medicine in Sanskrit in the Hindoo College, laying aside the prejudices of caste, and snapping by one bold stroke the bonds of superstition, dissected for the first time the human body with his own hands, and thus laid among his countrymen the foundation of that knowledge of anatomy which is so essential to the Surgeon.

We can scarcely now estimate how much is due to this gentleman's courage and good example; but we can see in the rapid strides that have since that time been made in surgical knowledge, something of the results of a step which has been so beneficial to its progress, that in little more than thirty years, Calcutta boasts of an Anatomical School, which may be rivalled, but is scarcely excelled, in Europe. When I say that 1,200 bodies were dissected in the past year in the College, where, thirty years ago, dissection was unknown, I say enough to speak volumes as to the spread of anatomical and surgical knowledge. It is at the same time subject for regret that recent alterations in Municipal laws as to the disposal of the dead threaten serious hindrance to the Anatomical School, by interfering with the supply of subjects. This, I hope, is only of a temporary nature, the attention of the authorities competent to deal with the subject, having, I believe, been directed to it.

Since that date the Medical College has contributed steadily every year to the number of qualified Surgeons practising in India, and spreading the benefits of rational medicine to the most remote parts of the Indian Empire. It's graduates, or those of the University, are found now in all parts of India, practising, not in an antiquated or obsolete

fashion, but up to the most recent state of European knowledge, and with an intelligent appreciation of the rapid strides that are daily being made in pathology and therapeutics: holding the responsible charges of civil stations and dispensaries, performing the most difficult and dangerous operations of surgery, with success that tells of the care with which they have fitted themselves for the duty. And it is to be borne in mind that each of these Surgeons, whether he be European or Asiatic, in addition to the duties of his Civil Hospital and Dispensary, commands by his private practice an influence on a large circle of the native community, so extensive indeed, that, in the remotest parts of the least inhabited provinces, European Surgery is respected as something, at all events, to resort to in cases of difficulty and danger. And in many parts of the country it has so thoroughly gained the confidence of the population, that they throng to the Medical Officer for advice and assistance. Different localities, according to the province in which they are situated, have acquired notoriety for special forms of surgical disease. What Elephantiasis is among the rice-eating population of damp Lower Bengal, Calculus is to the wheat-eating inhabitants of the dry north-west; and the extent to which these diseases are cured or alleviated you may form some notion from the records I shall lay before you.

I have, with some labour, made out a list of 180 stations in the Bengal Presidency in which Surgeons are stationed, and though it is but an approximation to the actual state of things, yet it will serve to show to some extent how far surgical practice is known. I have not had leisure to analyse or tabulate the results of these documents very closely, but sufficiently to illustrate the operations and by them the class of cases most met with in different parts of India. You will observe that whilst some are abundant, such as lithotomy, removal of tumours, and amputations; others, such as excisions of joints, ligature of arteries, for Aneurism, are rare. It also serves to show, roughly, the mortality after operations, and, as might be expected, that it is larger in cities and great Hospitals than in the Mofussil and the smaller Hospitals.

Abstract of important Surgical Operations performed in the last six months of 1863 *in* 180 *Hospitals or Dispensaries in the Bengal Presidency.*

Provinces.	No. of Dispensaries or Hospitals.	Number treated in Dispensary or Hospital.	Amputations.	Deaths.	Lithotamy.	Deaths.	Lithority.	Deaths.	Ligature of Arteries.	Deaths.	Removal of Tumours.	Deaths.	Scrotal Tumours.	Deaths.	Strangulated Hernia.	Deaths.	Radical Hernia.	Deaths.	Excision of Joints.	Deaths.	Trephining.	Deaths.	Plastic Operations.	Deaths.	Cancer.	Deaths	Perineal Section.	Deaths.
Bengal	54	101,746	30	3	43	4	..	..	..	...	39	..	16	...	1	1	2	...	2	...	2	2	..	..	3	...	1	..
Calcutta		165,424	22	11	25	4	..	..	1	...	113	..	29	2	7	2	5	...	...	...	..	..	..	..	3	...	11	3
		267,170	52	14	68	8	..	..	1	...	152	..	45	2	8	3	7	...	2	...	2	2	..	..	6	...	12	3
North-West and Central Provinces	89	271,816	40	6	330	25	1	1	..	...	99	..	1	...	...	..	2	1	3	...	..	..	2	..	6	3	4	..
Burmah	2	1,563	1	..	1	1	..	..	..	...	3	..	..	...	...	..	..	...	1	...	..	..	..	..	..	...	..	..
Punjab	35	110,316	22	6	224	31	..	..	..	...	31	..	..	...	2	..	..	...	1	...	1	1	1	..	2	...	1	..
		383,695	63	12	555	57	1	1	..	...	133	..	1	...	2	..	2	1	5	...	1	1	3	..	8	3	5	..
Grand Total ..	180	650,865	115	26	623	65	1	1	1	...	285	..	46	2	10	3	9	1	7	...	3	3	3	..	14	3	17	3

The causes of increased mortality after surgical operations are a matter of the greatest interest, and one that might profitably be made the subject of a lecture; but I propose now to consider only one of these (an important one), as the limits of this address do not admit of more.

Let me now ask your attention to some of these details. The statistics that I refer to are of the 2nd half of 1863, and the information has been collected from the official Returns of the various stations which have been placed at my disposal by the kindness of Mr. H. Macpherson. I do not profess to have made a complete record of all that has occurred, but enough to give an approximative idea of the extent and nature of the work done. In many of the stations the Surgeons are graduates of this College and natives of Bengal,—a glance at the table will thus show how widely spread our graduates are over India.

I have in the first place a list of 180 stations and their Hospitals or Dispensaries, with the number and nature of certain of the principal operations performed in each. In the second I have a *resumé* of the whole, an abstract vide Table in page 8, which shows, among other things, how largely the operation of lithotomy prevails in the Punjab and North-West, as contrasted with Bengal.

Thus, in Bengal, there were sixty-eight cases of lithotomy with eight deaths, or one death in 8·5 cases.

In the North-West and Punjab, five hundred and fifty-five cases with fifty-seven deaths, or one death in 9·9.

In Bengal forty-six cases of scrotal tumour with two deaths.

In the North-West and Punjab only one case of ditto, and that recovered.

I have not attempted,—for, indeed I have not had leisure to do so,—to gather from these returns the details of the operations they record. That is to say, I have not tabulated the precise nature, variety, locality of each operation, or what great master's proceedings have in individual cases been followed. I have merely recorded a general account of the great operations *en masse*, and it would be a matter of no small interest to compare the record with similar ones from European Hos-

pitals, and to trace out the causes of greater or less mortality or success. However such comparison might result, one thing is sure, that we have a mass of facts to deal with—the subject of much profitable study.

Before I speak of the special subject to which I desire to direct your attention this evening, I wish, as it has an important bearing on the matter, to make a few remarks on the Hospitals themselves.

I fear it is not in my power to say anything that can be considered encouraging on this subject. The Hospitals of Calcutta were built before Hospital construction had received the scientific consideration to which it has been deemed entitled of late years; and though we have more than one noble Institution, we cannot strictly be said to have really one good Hospital.

The "Chandney" Hospital, situated in the most crowded, and probably unhealthy centre of the city, is a low one-storied building, on the ground floor, capable of containing a large number of patients; but it is ill-constructed, shut in by surrounding buildings, and imperfectly ventilated, for such must be the case with buildings constructed on the plan of this Hospital, where the wards intercommunicate, and where the inner atmosphere of the building is common to each. Such an arrangement is altogether at variance with the modern idea of the ward unit, which should contain only a limited number of patients, be isolated, and thoroughly aired by cross ventilation. The recent addition of an upper-storied building, the dwelling house of former Surgeons of the Hospital, in which traumatic and other cases of importance are placed, and where operations of magnitude are performed, has, I am told, diminished the death rate, and rendered success more frequent than formerly.

The Returns of other years, I have been informed, indicate gangrene as the most frequent cause of death after surgical operations and accidents in this Hospital, and very discouraging and disheartening it must have been to the Surgeons who have had charge of the Institution to see their best efforts frustrated by this pest of Hospitals, this plague which owes its existence to, what, I believe, we must confess, though it be to our discredit, are removable causes.

But, with all its defeets, this Hospital must ever be regarded with the greatest interest, for it has long and justly enjoyed the reputation of being the Surgieal Hospital of Caleutta, and it has been the scene of some of the greatest surgieal triumphs aehieved by our best Surgeons (sueh as Martin and Webb) in India.

The General Hospital, vastly better situated and possessing many advantages over the "Chandney," both in construetion and loeality, is utterly defeetive in structure, and wanting in what, in these days, are justly regarded as essentials in Hospital arrangement and eonstruction. Perhaps more as a Medical than as a Surgical Hospital has this exeellent Institution been distinguished; but it is worthy of remark that here the first operations for the radieal eure of Inguinal Hernia were performed in 1856, according to Gerdy's method, by the late Mr. Bedford, and in 1859 according to Wützer's plan, by Mr. Scriven, the present Professor of Surgery in Lahore. Here, also, within the last few years, the external Iliae artery was tied by Dr. Brougham; the same operation, I might remark, having also been performed with permanent sueeess in the Chandney Hospital about the same period by the late Surgeon Allan Webb.

It does not eome within the seope of my subject to deseribe the labours of the many distinguished Medieal Offieers who have been attaehed to this Hospital and left their contributions to Indian Pathology as a guide to those who have come after them; but we can hardly mention the General Hospital without recalling the names of Twining, Maepherson, and Hare.

As to our own magnificent building, the Medical College Hospital, so grand as a work of architecture, and yet so defeetive as a Hospital, what ean I say more than that, whilst in some respeets it is equal to the first, in others it is defeetive with the worst Hospitals in Europe!

It would ill beeome me to judge this noble building or eriticize the designs of its spirited founders by the standard of reeent Hospital architectural design. It was eonstructed with the greatest liberality and with every attention to solidity, goodness, and comfort. Its magnificent wards or halls, the spacious dispensary and operating theatre, indicate that the

important consideration of ventilation and abundance of cubic space were fully considered, at the same time that architectural beauty was not forgotten. But I confess, with all respect for its designers, that it is difficult to understand how it escaped, if it did escape their notice, that the wards would be ventilated from end to end, and that thus the miasm of the patients at one end must be blown, according to the prevailing winds, down to the patients at the other *(viresque acquirit eundo)*. Nor is this objection a fanciful one, or merely of theory. I am quite aware that many degrees of departure from the ideal of perfection may be admitted, and yet, practically, a good and healthy Hospital may result. But I cannot say that it has been so here; I and my colleagues know that it is not, and that this is one of the causes of increased mortality which, I am happy to say, has been somewhat abated since the council-room, a large ward with cross ventilation, has been converted into a surgical ward.

Moreover, the intercommunication of the wards, as is the case in the arrangement of this Hospital, where they all open into one another by arched spaces, though admirably adapted for the Halls of a college, library, or public institute, is not so well adapted for the treatment of the sick, who are thus rendered incapable of segregation or classification. It cannot be expected, under these circumstances, that the standard of success should be very high, where the emanations of Fever, Bowel-complaints, Pyæmia, &c., &c., commingle and diffuse themselves throughout the common atmosphere. The presence, too, of Lying-in-Wards within the walls of the Institution is at variance with the existing views of Hospital hygiene, and, if I may say so, suggests the expediency of removing this very preventible cause of disease, and the advantage that would result from devoting the space it occupies to the reception of Surgical cases, thus effecting a more complete separation from the Medical cases, which would remain on the other side.

There are many other defects which I might notice, such as the absence of all means of classification of disease—of wards for infectious diseases, and, until lately, of accident or cholera wards, of proper reception and waiting-rooms for out-patients and those seeking admission. The want of *convenient* bath-

rooms for patients, of waiting-rooms for attendants, and of rooms for the Physicians and Surgeons for the purposes of convenience or consultation. The narrow verandahs, scarcely broad enough for two persons to pass each other, the location of Ophthalmic wards in the dark and damp ground floor, the presence of the operating theatre in the most exposed and prominent, instead of the most secluded and retired part of the Hospital, and other defects which I need not detain you to detail. All these, I say, mar the perfection of this, otherwise, noble Institution.

These defects are, to a certain extent, remediable, and already something has been done, and more is in contemplation. The time, I trust, is not far distant, when the Surgical wards will be where those now occupied by the Midwifery Department are, and that Institution will be replaced, as it most assuredly should be, by a separate and distinct one, such as the Metropolis of India might and ought to maintain. Cholera and accident wards have just been added, and the Dispensary has been removed to the ground floor, whence we hope ere long to see the Ophthalmic Department removed to take its place in a separate and appropriate building.

Defects remain which, from the construction of the building, situated as it is in a crowded part of the city, are perhaps irremediable, but still the Hospital is susceptible of considerable improvement, and though it may never reach the highest standard of perfection, its utility may be increased and its salubrity improved.

Public attention is now more directed to Hospital construction and hygiene, and defects of the class I have alluded to will doubtless receive the attention and consideration they merit. The construction of Hospitals on modern principles, with all that is most desirable for the welfare of the patients, whether Surgical or Medical, will, no doubt, be the anxious consideration of the authorities; and the marked interest evinced by Government in State Sanitation is demonstrated by the appointment of a Sanitary Commission to watch over and supervise these and kindred subjects.

With reference to the Hospitals of the Civil stations, I should like to have said something more than time will admit of. But I would especially advert to the Mitford Hospital

at Dacca as an example of progress and improvement. The premature and untimely loss of the distinguished Surgeon who so lately died there in the execution of his duty, during a cholera epidemic, to which he fell a victim, worn out by his unceasing attention to the sufferers, is fresh in our memory, and deeply and truly do we mourn in the loss of Dr. Simpson that of one of the greatest Surgeons India ever saw.

The Hospitals of the Mofussil stations generally, however defective or primitive they may be,—and doubtless they are so in the smaller stations,—yet have the great advantage of country air and freedom from the contamination of city miasmata. The Surgeons, also, have the great advantage of healthier subjects to deal with, more vigor, higher vitality—a difference just as great in India, as it is between the citizen and rustic in England. However far it may be true that the healthy, simple living native of the Mofussil is peculiarly tolerant of surgical operation and injuries, and capable of the most marvellous recoveries from severe and dangerous wounds, I must demur to the extension of this theory to the inhabitants of large cities, and Calcutta in particular. In fact, so far from being favourable subjects for surgical operations, I regard them as quite the reverse, and feel assured that, to the Surgeon who has had the opportunity of treating serious wounds or operations in the rustic native, the difference must be as remarkable as discouraging. When I say that I do not believe the Hospitals of Calcutta can record three successful cases of amputation of the thigh in as many years, I am not so much reflecting on the hygiene of the Hospitals as on the locality, and the subjects who are admitted into the Hospitals for treatment. Statistics will, I think, confirm what I say, and though it is true that Hospital construction may have something to say to this high mortality, yet I feel convinced it is due more to the people and the place than to the Hospitals. It would be a curious subject to consider and investigate why the same class of people should suffer from one form of diseases in one hospital, from others in another. Why, for example, Gangrene should have infected one, whilst Pyæmia has troubled others; such differences, no doubt, are fairly traceable to local influences, and may be due to defective sanitation, which is capable of amelioration. But that either of these forms of disease should occur at all to the extent to which

they have existed, is, in my opinion, giving all due weight to local causes, more due to the city atmosphere and the people themselves, than to any other.

This brings me to speak of certain points of interest in relation to the mortality after surgical operations, and, as my time is limited, I shall confine myself to the subject which, in this respect, has most occupied my attention, and is interesting as one of the chief sources of the Pyæmia which proves fatal to so many of our patients.

The subject that I desire to ask your attention to is one of the frequent causes of death after amputation, or other injuries, or surgical operations involving section of bone.

In illustration of this, I have noted a series of amputations that have occurred during a period of two years, in my practice in the wards of the Medical College Hospital. These amputations, thirty-two in number, were all capital operations, *i. e.*, of the upper and lower extremities, either at the joints, or through the continuity of the long bones. They were—*one of the hip, three of the thigh, ten of the leg, four of the ankle (Syme's), five at the shoulder joint, five of the arm, four of the fore-arm. Of these, thirty-two in all, three* were secondary amputations, and of the *number, fourteen lived, fifteen died. Of the deaths, nine resulted* from Pyæmia, the consequence of Osteo-Myelitis, *three from Pyæmia* not depending on bone disease. There were *six deaths* from other causes, such as Tetanus, Gangrene, Exhaustion. Now it will be at once recognized that this proportion of deaths from Pyæmia, depending on bone disease, is something unusual—something very different to the ordinary death Returns of other hospitals. It is this, therefore, that I wish specially to call your attention to, not only in regard to its pathology, but with respect to the treatment, which involves a question of amputation of much importance.

The subject of acute suppuration in bone is one which has, apparently, not attracted much attention hitherto in this country, nor, indeed, has it been, so far as I am aware, so much studied anywhere as by the French Surgeons, who have given it the name of *Osteo-Myelite*, by which we also now distinguish it. M. Jules Roux, Surgeon in Chief of the Great Naval Hospital of St. Maundrièr in Toulon is the

authority to whom we are indebted for the most elaborate account of this important subject in both its pathological and surgical bearings. His experience was chiefly gained in the treatment of the wounded of the French-Italian war, who were sent to Toulon for treatment—all, consequently, cases of disease or injury of some standing; and the results of his observation and treatment are interesting in the highest degree: for they not only establish the recognition of the disease as a formidable result of operations on bone and of injuries, such as those inflicted by gun-shot wounds in bone, but they point to the necessity of thoroughly re-considering the question of amputation, and fully, in my opinion, tend to confirm the view that the site of the amputation has, not less than the time at which it is performed, much to say to the mortality.

M. Legouest tells us that at the Hospital of Dolma Batchè in Constantinople, out of 639 cases of amputation, M. Salleron lost 224, or little less than one-fourth. The amputations in the continuity of the bone were 490, resulting in 192 deaths from purulent infection of 1 in 21·2. The disarticulations, in number 149, resulted in 32 deaths, or 1 in 42·3.

M. J. Roux records, in his practice in St. Maundrièr, the following remarkable success in the treatment of serious cases of gun-shot injuries requiring amputation, all being secondary amputations.

4	Hip-joint	...	successful
13	Shoulder „	...	ditto
1	Knee „	...	ditto
3	Ankle „	...	ditto
1	Metacarpo Phalangial		ditto

A series of 22 successful disarticulations, 20 of which followed gun-shot injuries of bones.

Now it is perfectly clear that this extraordinary success is due to something more than the skill of the Surgeon, the advantages of the Hospital, or other local conditions in which the patients were placed; and I think the evidence is strongly in favour of the fact that disarticulation is frequently a safer method of amputation than section of the injured bone, and also, that in cases where the bone is affected from local endemic causes, it is a clear indication that removal of the bone so diseased is desirable—That, after amputations, they have this

tendeney, in eertain eases, to beeome diseased, there ean be no doubt, and, in eertain plaees, and under eertain conditions, this tendeney is more strongly marked than in others. It has long forced itself upon my attention in this Hospital as one of the most frequent sources of purulent infection and consequent mortality from which we suffer.

I would be understood that it is not to the *disarticulation*, as sueh, that I attribute the suecess in all eases, nor do I urge the operation always in preference to seetion of the bone of the next segment of the limb. In the eases of the hip and shoulder, disartieulation, of eourse, alone is praeticable; whereas in the leg and fore-arm, the respective advantages of disarticulation at the elbow or knee may fairly be questioned; and I have no hesitation in saying it is my opinion that, exeept in cases of endemie tendeney to Osteo-Myelitis, seetion of the Humerus or Femur, in their lower third, is as good, if not a better operation than disartieulation. The great point to be attained is removal of the whole of the suppurating bone; of eourse, whenever the endemie tendency to Osteo-Myelitis prevails in a Hospital, this disarticulation, though, in itself, inferior as an operation to section of the bone (aeeording to my view in the case of the elbow and knee), would be preferred to amputation through the bone, as the fresh bone-wound might, under the endemie influenee, give rise to an attaek of Osteo-Myelitis.

The points of interest in M. Roux's treatment are, that by disartieulating, he antieipates the ehanee of Osteo-Myelitis, by not opening the caneellated tissue of the bone (in ordinary wounds); and that in eases where it has set in, he removes the souree of blood eontamination by the ablation of the affeeted bone.

I have no intention of disenssing the question of the general applieation of the term Osteo-Myelitis in the wide sense in which it is given to the ehronie form of disease by the French Surgeons, and whieh involve a whole series of pathological ehanges in bone, in whieh the neeessity of immediate amputation, is, at all events, not eoneerned. But it is to the acute and diffusive, a sort of erysipelatous form, an analogue of diffuse suppuration in the areolar tissue, that I refer,—a disease, so far as I have seen it, so extensive, as regards the bone

it affects, that it causes its entire destruction, and speedily, if not removed, gives rise to that septic condition of the blood which results fatally in a large number of cases, and where, after death, the evidences of the blood-poison are seen in structural changes in the viscera of the most interesting nature. These I will presently describe. It is to this point in the pathology of the disease that I would especially call attention, for, grievous as the injury of the bone is when it becomes the seat of this acute suppuration, it is not *the mere local mischief* that one dreads, although that may cause the loss of the limb. It is the *constitutional disease* to which it gives rise, and the consequent morbid condition of the blood, which is, I believe, if once thoroughly established, and not promptly dealt with, certain to entail fatal results, that we must consider *the great source of danger*. It is, then, not only to the disease, acute suppuration in the cancellated tissue, involving the whole bone and causing its rapid disorganization, but it is also to the treatment by which I believe, if the disease be early recognized, life may be preserved, that I would call attention, and it involves a question of amputation of the greatest importance, which I think I have satisfied myself in my own experience, as well as by the results of M. Jules Roux's practice, is deserving of the consideration of every Surgeon. It is, indeed, not less than it was pronounced to be by the Baron Larrey,—"a system which, if it could be adopted without control, would be, so to speak, to revolutionize the Surgery of amputations." It is not, I need hardly say, to be adopted without control, but to be carefully considered and applied in fitting cases. It is a doctrine that will thus be the salvation of many lives which otherwise would be lost.

It appears to me that if I give a brief account of the symptoms of the disease, and the pathological phenomena both in life and after death, illustrating them by the detail of successful and fatal cases, that I shall be best disposing of the time left, for, indeed, I have already occupied you too long. I would also say something on the treatment both prophylactic and curative, endeavouring to point out the occasion when amputation is needed. I would further request your attention to the pathological changes in fatal cases, and these I have the means of illustrating to a certain extent

by drawings taken from nature, or the preparations themselves.

The symptoms of this formidable disease of the bone are local and constitutional. Obscure in the out-set, both, if looked for, are to be recognized, and it is of the utmost importance that this should be done early.

I have already said that this disease had forced itself upon my notice as a frequent source of failure *here* after surgical operations involving section of bone, amputation, &c., and it is to be understood that it is of the diffuse suppuration of the bone, I speak, and not of those partial inflammations that are included by M. J. Roux in the category of Osteo-Myelitis, and which gave rise to the following remark from the Baron Larrey,—"I would ask M. Roux if the Osteo-Myelitis which complicates a fracture, interfering with union by hindering consolidation, is also the Osteo-Myelitis which prepares the callus, saving the life and limb of that patient?" For in that case there would be two very different kinds of Osteo-Myelitis, the one absolutely morbid, entirely pathological, the other essentially curative and salutary. But where would be the limit between the two?

The endemic prevalence of the form of Osteo-Myelitis is, no doubt, due to a combination of causes existing in the people, the place and the Hospital, and though, no doubt, the hygienic condition of all these are important, yet I believe that, so far as the Hospitals themselves are concerned, we are liable to err in attributing too much to their defects; for, as I have before remarked, though far from perfect, they are infinitely better than many where it is never pretended that Pyæmia results from defective hygiene.

Osteo-Myelitis may have its origin in any wound, injury, contusion of the bone, or of its periosteum, or medullary membrane; sudden extremes of heat or cold, constitutional vice, such as syphilitic or strumous deposits in bone, necrosis of the exterior extending inwards, and so causing mischief there.

I would repeat that I am alluding now only to the acute form of the disease. The suppuration that invades the entire medulla of the bone. Why it should occur in some, and not in others, or why it should occur, when the healthy condition and vigorous granulation of the soft parts of the same limb, or

of other wounds treated in the same wards and under similar local influences, indicate that the hygienic conditions, *generally*, are favourable, I am unable to say, or why the vascular highly-organized tissue of the medulla, and the cancellated portions of the bone, should take on this diseased action, and rapidly degenerate into a putrid mass of pus and caries, whilst the muscles and other tissues that were divided at the same time, are still healthy, and the general health of the patient and those about him is good (until compromised by blood contamination), I know not; but I have frequently seen that such is the case, and I have frequently detected at the bottom of a sinus in the otherwise healthy stump, dead bone, which, when exposed, presented not only necrosis of the surface, but also death of the medulla, which, if not speedily removed, would have been, and in some cases has been, the cause of death.

The symptoms of this formidable disease are, in the outset, said to be obscure. The local symptoms, no doubt, may be so, where the affected bone is unexposed or undivided. The constitutional symptoms are those of Pyæmia, and, at the outset, may be mistaken for a mere access of fever, a rigor such as may follow any great surgical operation, or may occur from other causes. But as the local and constitutional symptoms progress, the doubt is soon cleared up. The symptoms, in the acute form, generally make their appearance early, within a week or ten days, it may be earlier, after the operation, wound, or injury. The stump, wound, or contusion, may have been doing well. It may, perhaps, have sloughed a little, and the sloughs have cleared away, healthy granulations having appeared. The flaps may have united, almost by first intention (this is a point to which Sedillot directs attention as a thing to be avoided), or all but at a point or two, whence discharge continues. The pain is not necessarily acute, and the tenderness on pressure of the stump is but slightly increased. The discharge becomes more profuse, but it is not healthy well-elaborated pus. A probe being introduced, the bone is found dry and denuded, and, if exposed, the medulla will probably be found protruding like a fungus whilst the periosteum is stripped from the end of the bone. With all this there may have been only a quickened pulse, a febrile condition at some

time of the day; the temperature, at others, being at, or even below, the natural standard; rigors, as yet, so slight as hardly to have attracted attention, may have occurred. Such are the early stage and symptoms, local and constitutional. These rapidly progress and develop themselves in the most marked manner, and it is here that the critical period has arrived when it is necessary to make a thorough examination, and decide the question whether it be Osteo-Myelitis or not. Exploration should be made with the finger, the stump, if necessary, being sufficiently re-opened to admit of your doing so, and the condition of the bone should be most carefully examined and ascertained. In incipient cases, the medulla will be found protruding like a fungus, and the bone surrounding it exposed to a greater or lesser extent. At a later period, the end of the medulla is found already dead, blackened, and encrusted, but within it is a putrid mass of bone *debris*, and pus—a probe passing down the entire length of the shaft. In the former stage you can wait and watch progress, the mischief may be limited, and a ring of bone be thrown off. But in the latter case, immediate interference is necessary, and nothing less than amputation, either at or above the next joint, will suffice. The constitutional symptoms will also have indicated the necessity for interference, and they are the symptoms of Pyæmia of a marked character. Rigors, followed by fever and profuse sweatings, rapid and feeble pulse, a yellow or muddy tinge of the skin and eyes, short and hurried respiration, tongue sometimes dry and coated, at others clean, but smooth and stripped of the epithelum; Sudamina on the trunk; pain in the thorax, abdomen (hypochondria), or in the vicinity of the large joints; expectoration, not unlike that of pneumonia; constipation at first, but ultimately diarrhœa and a tympanitic state of the abdomen, whilst at the same time, a peculiar mouse-like odour is given off from the body. As the disease advances, the rigors become more frequent, the patient wanders, and he passes into a typhoid condition; sometimes life passes away gently or in the low muttering of typhoid; in others, violent delirium precedes it, though, for the most part, death occurs quietly as from extreme exhaustion.

The Hypochondriac tenderness and hurried breathing with friction sounds or bronchial râles, are the physical signs that

indicate the important changes taking place; though, I must confess, that I have occasionally in the worst cases failed to detect any one of these.

The pathological changes found after death are very interesting, and are described in the *post mortem* of a fatal case, I will presently relate. The changes in the urine during the disease are also worthy of note; though on this part of the pathology more information is needed. I have the notes of the state of the urine for some days during the life of one patient, for which I am indebted to Baboo Kany Lall Dey.

The sp. gr. varied from 1004 to 1015, the re-action generally alkaline; urates increased.

Traces of albumen and granular casts at times.

And an excessive amount of chlorides, from ·4 to 2·4 in an ounce; and of sulphuric acid, from ·446 to 1·031 in an ounce.

The treatment.—Prevention here is indeed better than cure. The former *may* be accomplished; the latter, when the disease has thoroughly established itself, is, to say the least, very rare.

The preventive measures are all such as are included in the great questions of Hospital hygiene,—free ventilation, good food, and segregation of patients. Osteo-Myelitis occurs no doubt, like other diseases of the same genus, more readily where numbers are crowded together, and where the ventilation and other sanitary arrangements are also defective. The disease is also at times epidemic; It has visited Hospitals for a time and passed away, like erysipelas or gangrene, as was the case in the Hotel Dieu in 1814, where it caused great mortality after amputations. It is more or less endemic, as in our own Hospital, and how far it is due here to insanitation I am not prepared to offer an opinion, but I have already said that I think it is at least as much due to the people as to the Hospital, and I can say that no efforts have been spared to remove all local causes of disease.

Wherever sanitary arrangements are good, with pure air, good food, space large, and, above all, where the patients are not overcrowded, the conditions exist which are unfavorable to the occurrence of the disease.

As to treatment, the earlier the disease is recognized, the more likely is any treatment to be successful.

When the pulse quickens, and rigors occur, when the discharge begins to assume an ichorous and unhealthy character; when, on examination, the bone proves to be denuded of periosteum and the medullary cavity filled with dead bone and pus, I am satisfied that the sooner amputation at, or above, the next joint is had recourse to, the better is the chance of saving the patient's life. The danger is of waiting too long, long enough for the blood poison, or the capillary embolism, to have brought about changes in the viscera, which are the precursors, if not the cause, of death.

On the earliest appearance of these symptoms after an amputation or injury of bone, the sooner the bone is thoroughly examined the better, and the conditions I have described being detected, the sooner amputation at or above the next joint follows, the better also.

As to the use of internal remedies I have little to say, none, so far as my experience goes, have any effect. The Tinc. Ferri Sesquichloridi, Port Wine, Quinine, and, according to Polli, the Sulphites, have been freely used; but to none of them have I been able to ascribe any curative effect. Beyond supporting the strength, removing the source of the toxæmia by amputation or excision of the bone, and the administration of preparations of iron with stimulants, I know of no hope or chance of saving life; and when the lungs or liver have become affected, it is indeed small.

I cannot say recovery is impossible, for, indeed, if the symptoms be early observed, and prompt measures had recourse to, before the blood-poisoning have advanced too far, I believe it may and does occur; and the case I shall relate to you, in which recovery followed secondary amputation, is one in point. Youth and vigorous constitution, aided by early removal of the diseased bone, no doubt, were the chief causes of recovery.

In those cases where collections of pus form external to the cavities, as in the joints,or under the superficial muscles, early evacuation of the pus and careful support by nutrients and stimulants, with change of air and other improvements in the hygienic state of the patient, may bring about recovery, but in cases of toxæmia from Osteo-Myelitis, the tendency

appears to be to cause the visceral changes I have alluded to, and not the more superficial deposits of pus.

Early amputation, or re-amputation, therefore, is the remedy which offers the best chance of success, and it should be, *not* in the continuity of the affected bone, but either at the next joint, or through the next segment of the limb.

In M. Roux's hands disarticulation has had the most marked success. It has been with him not only curative, but prophylactic. *Prophylactic,* because knowing the tendency of bone to take on this disease when its cancellated tissue is opened or injured, he avoided this by amputating at the joint.

The proper time for amputation (or removal of the affected bone) in Osteo-Myelitis is not difficult to determine, for it should be as soon as possible after having ascertained that the bone is so affected, and, as I have said, the diagnosis is made by the constitutional and local symptoms, and by passing a probe into the medulla of the bone. Should it impinge, on healthy *bleeding* medulla, near the surface you may, if the constitutional symptoms are not urgent, wait and see if nature will limit the suppuration and throw off a ring of diseased bone; such expectations are, in my experience rarely realized, and the doubt is generally resolved, not in favor of the bone. However, this is one of the nice points of discrimination in the treatment, and for which no absolute rules can be laid down. The constitutional signs, the state of the pulse, respiration, and temperature, would be important indications of the patient's condition, and they cannot be too carefully studied. A pulse exceeding 120, persistent temperature above 104, bronchial rales, hurried respiration, tenderness over the hypochondria, are symptoms that should cause the greatest anxiety on their first appearance, and very speedily decide the fate of the patient or of his limb.

I will, with your permission, read the outlines of two cases, one fatal, in which the symptoms during life and the pathological changes after death were well marked. The other successful, in which recovery took place after the symptoms of blood poisoning had supervened on Osteo-Myelitis. Amputation on the hip-joint in this case proved perfectly successful. I have had the bones in each case placed on the table for your inspection, and though the appearances are much changed by

the action of the spirit in which they have been immersed, yet they still display the changes that have taken place.

In the fatal case, it is true that disarticulation was not performed, but section of the humerus above the joint *was*. Whether disarticulation at the elbow joint would have been more successful, I cannot say; that the injury inflicted by the saw, the "traumatism," to use a French expression, was the direct exciting cause of the recurrence of the disease in the humerus, appears probable, and certainly, so far, is an argument in favor of M'Roux's theory of disarticulation.

Case 1.

A healthy young man named Hurish Chunder Sircar, aged thirty-four years, was admitted, on the 6th November 1864, with a large tumour of the lower part of the right fore-arm, about the size of a cocoanut. There was an ulcerated opening in the tumour, the result of a moxa, and from it issued a dark sanious ichor. The duration of the tumour was one year, and it was apparently Enchondromatous, and not Malignant. The glands in the axilla not enlarged, and the general health not affected.

I removed the tumour by excising it with the lower third of the ulna, on which it was situated. The muscles and tendons were turned aside, the ulnar artery was divided and ligatured, other smaller branches were also tied. The wound was stuffed with lint to prevent hœmorrhage. He did well at first, but the suppuration became very profuse and extended up the arm; his pulse began to quicken; fever came on. He was ordered good diet. The Tinct. Ferri Sesquichloridi min. xv. thrice daily. The sutures and ligatures all came away in due time, but the suppuration increased and indications of systemic affection became more marked, the bone became denuded of periosteum, and the medulla protruded in fungoid form. On the 21st of the month he had rigors, followed by profuse sweats, pulse 130; the wound itself had nearly closed, but the discharge from a counter-opening was very free. The arm was infiltrated and œdematous, the superficial veins marked by discolored lines on the limb.

It was evident, from both local and constitutional symptoms, that it was not possible to save the arm, and I accordingly amputated it high up near the shoulder joint by double flaps.

He lost about eight ounces of blood, as the vessels were all enlarged and numerous. This occurred on the 21st November. On the 23rd November it is noted that he was doing well, still rather feverish, but pulse quicker than before the operation.

26*th November*.—Pulse rapid, 130; cough troublesome; the stump somewhat swollen, and the discharge profuse. He has been ordered the Hyposulphite* of Soda, grs. xv, every three hours.

Last night he had a sudden and violent rigor; this was followed by sharp fever and sweating. Several ligatures have come away. He takes beef tea and port wine. I have noted that I fear the prognosis is unfavourable, and that his constitution is too far affected to justify amputation at the shoulder joint.

28*th November*.—"He has had repeated rigors, with rapid pulse in the intervals of the fever that followed."

Quoted from report of case.

Tremors of the muscular system, occasional cough, respiration somewhat hurried. I have no doubt changes are taking place in the viscera, but there is neither abnormal thoracic sound nor abdominal pain.

3*rd December*.—He is low, pulse rapid, the rigors and fever still continue, soft parts of the stump, up to this time healthy, now do not look so well. The bone, on examination, proves to be less diseased than I expected. The medulla protruding still bleeds, the periosteum is still adherent to the greater part of the end of the bone.

There is slight diarrhœa, he takes in consequence Tinct. Opii min. x, with each dose of the Hyposulphite. He is to take stimulants frequently.

4*th December*.—He died last night; having become, suddenly, much worse, he sunk from exhaustion.

---

* According to the theory of Polli, of Milan, that sulphurous acid prevents or arrests the putrefactive metamorphosis of animal tissues and fluids, and that the action of the sulphites would cause resistance to the catalytic action and operation of morbid poison, which (as in this case) would induce an unnatural rapidity of putrefaction.

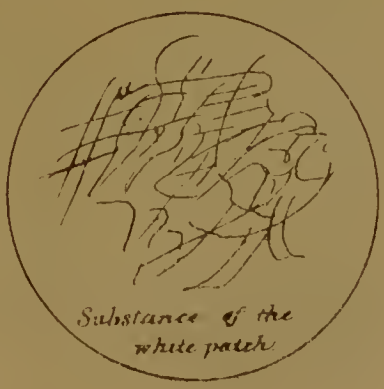
He says that the sulphites, when given internally, are absorbed, and exert their specific action upon the blood and tissues.

Vide British Medical Journal, October 1st, 1864, page 388. Mr. Spencer Well's Lecture.

Post Mortem.—*4th December,* 9 A. M.—Abdominal viscera, liver, spleen, and kidneys, healthy.

Thorax.—Pleuræ contained turbid puriform serum, anterior surface of lung quite healthy in appearance; posterior portion of lung deeply congested; the left pulmonic pleura thickened, and covered with dense deeply yellow colored lymph of a puriform appearance.

Lungs, chiefly posterior portions, full of patches of dead tissue, and in some places, where deeply congested, drops of pus oozed out on section and pressure; but these were independent of the dead patches. The lungs, *en masse,* floated in water, though the portions containing the white patches sunk. I examined them carefully under the microscope and could detect only broken down granular matter and lung tissue, (vide Sketch) *no pus,* or only a few globules, and these shrivelled and imperfectly developed. The patches to which I have referred were numerous, from the size of a pea to that of a rupee, and when cut into, presented a dead white appearance, with a fœtid sanious fluid exuding; in some there were granular cells, pus or altered white corpuscles, and round them, in certain cases, a dark areola of congested lung tissue, and in some instances, those, I presume, of longest standing, there was pus, the result of suppuration, set up by the irritation of the presence of the dead tissue, just as in the case of an ordinary boil, where the dead piece of areolar tissue (the core) is thrown off by suppuration taking place around it.



Microscopical examination of white patches in the lung of Pyæmic patient. (250 Diameters.) Pyæmia originating in Osteo-Myelitis after excision of bone and secondary amputation of the arm. Patient's name Hurrish Chunder Sircar. Died December 4th, 1864.

I have had doubts as to whether this was really a portion of dead lung tissue, or whether it was not merely a portion of lung infiltrated with aplastic exudation; whatever it may be, it certainly *is not* what it is usually called, an abscess, and this is a point in the pathology to which I particularly desire to call your attention; and if it be dead tissue, how is the death caused? Is it by capillary embolism? or how does the blood poison operate? Is it in producing inflammation, or, as I, regard it, death of the tissue previous to the inflammation, which is a consequence, not a precursor of the death?

I feel inclined to explain it by embolism in the pulmonary arterial capillaries (the microscopical emboli having arrived there through the heart), or, at all events, death is caused by some process analogous to that by which the portion of areolar tissue that forms the core of a boil is *killed* before inflammation is set up round it, to throw it off, a process which having taken place gives rise to the abscess, in the centre of which the core of the boil is formed.

The axillary vein was found filled with black jelly-like clots; near the stump a firm fibrinous clot blocked up its calibre. This clot was yellowish in color, and closely adherent to the living membrane of the vein. This was in one part red, in another pale and roughened, and the surface could be easily scraped off with the back of the scalpel. The smaller venous branches contained a puriform matter, which flowed out on pressure from the cut ends. The state of the cephalic vein is not recorded.

The *bone* contained pus up to the head, and here and there, little depôts of it, besides the general infiltration of the cancellated portion of the bone.

This case is a good one, as it illustrates the chief points of interest in both the surgical and pathological bearings. I will now relate a case in which the result was recovery. I should apologize for again bringing this case before the Society; but as it best illustrates the points I wish to urge, I must ask your permission to do so.

Case 2.

A Mahomedan lad, aged 16, was admitted on the night of 10th April 1864, having received a severe injury to the right

knee-joint by a kiek from a horse; the joint was opened. Amputation at the lower third of the thigh was performed early on the morning of the 12th April.

On the 15*th* it is noted that the interior of the stump is exposed, the end of the bone denuded of periosteum, and the medulla discolored. Pulse 100. Feverish.

On the 19*th* a probe passed into the medulla; deteeted dead and putrid bone with pus. But no well marked eonstitutional symptoms, exeept pulse of 100. No diarrhœa. Appetite fair. Soft parts of stump quite healthy.

On the 21*st* mischief extending; long probe passes down to the head of the bone in the suppurating medulla. Pulse 104.

22*nd*.—Pulse 120. Fever in evening.

23*rd*.—Pulse 130; very excitable; quickens easily. Has diarrhœa.

24*th*.—Pulse 140. Feverish. Tongue moist, but smooth. Probe passes down to the head of the bone and eauses pain there. Diarrhœa continues, peculiar muscular tremors, rāles in chest with eough. No hepatic tenderness.

Amputated at hip-joint by antero posterior flaps. Divided the bone just below the troehanter, but as pus oozed from the eancellæ, I at onee removed it. His pulse, I should observe, was 150 when the operation eommenced.

He remained in a very critical state for some days after the operation, but the pulse gradually eame down. The temperature decreased; diarrhœa disappeared; tongue improved, and strength returned. On the 28th, for example, it is noted that the pulse is 140; temperature in axilla 102.

On the 3rd May the femoral ligature eame away. Thermometer 98, pulse 128. Chest sounds are better; rāles less sonorous. Moist rāle in upper right ehest less crepitant.

All this time he was well fed and supplied with port wine.

It is not necessary to trouble you with the daily details, sufficient that he made gradual progress towards recovery, and a sinus, which was the last indieation of the wound, contraeted and had perfeetly closed by the 31st July. He was diseharged eured on that day, and is now in robust health, employed as a tailor in the Hospital.

This case I regard as very interesting, the indications of blood contamination were so clear. The amputation at the hip-joint appears to have been only just in time to remove the source of blood poisoning; the youth of the patient enabled him to throw off the ill effects of the toxæmic condition to which he had been reduced. In all respects, therefore, this case is an interesting one, and, as I think, illustrates fairly the advantage of re-amputation, when the bone has become the seat of Osteo-Myelitis.

I have yet two other cases, which I would ask your attention to for a moment before concluding.

Case 3.

Patient's name Golam Alli; male; aged 20; Mussulman; syee; was admitted into the Medical College Hospital on the 2nd September 1863, 2 P. M., with a vertical wound about three inches long on the right shin. The right leg also was severely bruised. Two small bruises on the anterior aspect of each of his knees, and one on the external aspect of each of his ankles; no fracture of bones.

The bruised tissues began to slough, and on the 9th September the sloughing had increased, the tibia was exposed and denuded, but not dead.

From the evening of this day he had fever, without shivering, for three or four days. The fever left him, and on the 17th the ulcer looked healthy, there was no fever, and the denuded bone was covered with healthy granulations.

On the 19th he complained of some pain in the ulcer, but was otherwise the same; had an attack of fever on the 28th; on the 30th the ulcer was healthy; a scale of bone necrosed, but not yet exfoliated; the patient very much emaciated and countenance somewhat anxious; had another attack of fever on the evening of 30th; complained of pain in the chest.

On the morning of the 2nd October it was reported that he had fever last evening; pulse 130; increase of temperature in the right knee-joint; tongue moist, is slightly feverish; appetite poor; is thirsty.

The fever returned almost every day at evening, and on 5th October some abscesses were detected in the right leg, one on

the outer side of the knee-joint about the head of fibula, and another on the inner side of tibia, about two inches below the knee. The abscesses were opened.

6*th*.—The abscesses discharged freely, but he still complained of a good deal of pain in the knee-joint. Pulse quick, 140, tremor of hands.

He gradually became worse, and died on the 10th October 1863.

Post mortem, twelve hours after death.—Body very much emaciated. On opening the chest the lungs were found to be adherent to the parietes by some old adhesions, more so in the lower lobes of both lungs posteriorly patches of lobular inflammation were found scattered in both the lungs to a more or less degree: of these, some were in a consolidated state, with white patches, others far advanced in suppuration. The heart with its coverings appeared healthy.

On opening the abdomen the liver was found to be somewhat enlarged in size, but otherwise healthy. Kidneys and spleen normal.

On laying bare the right leg about the ulcer, it was found to be a mass of suppuration, which extended downwards and upward, in the latter situation burrowing into the cavity of the knee-joint. The medulla of the bone (tibia) was found to be infiltrated with pus. The lining membranes of the peroneal and posterior tibial veins were found to be covered with puriform fluid. On tracing the popliteal vein upwards, a coagulum was found blocking up the calibre of the vessel. This coagulum extending to about half of the external iliac, and at the position where the vein passes under Poupart's ligament to form the iliac, there was found a coagulum of blood with a cavity in the centre filled with puriform matter.

Case 4.

Patient's name Byconto; male; aged 25; Hindu; by occupation boatman; was admitted on the 14th February 1864 with gun-shot wounds in the right thigh with fracture of great trochanter. There were two wounds, one about the size of half a rupee, and the larger of the two was situated about the middle of his right thigh, a little to its outer side, and another about three inches above the trochanter of the same side, but in a line with it—in its passage the bullet had struck the trochanter major and fractured it.

The patient came in three days after the accident. He did well, for two or three days was without fever, the wounds discharging healthily; on the 19th he was slightly feverish; discharge from the wounds copious. Bowels rather loose; tongue furred, and pulse quick.

On the 20th and 21st he was much about the same.

On the 22nd, 23rd, and 24th there was no fever; the ulcers looked healthy, and the discharge was less.

On the 25th and 26th he was again feverish in the evening; discharge healthy but copious; wound flabby. Complained of loss of appetite.

On the 27th an incision was made upon the trochanter major and some bits of necrosed bone removed. On the evening of 27th he was again feverish and complained of much pain in the leg. He gradually got worse, his appetite failed; discharge became fœtid; tongue dry and furred; had fever every evening, and gradually sunk on the 6th March 1864.

Post mortem examination, 7th March.—Body much emaciated. There was lobular inflammation in both lungs, with Pyæmic patches. There were also several petechial spots. There was a patch of pleuritic inflammation on the lower and anterior portion of left lung. There was a large fibrinous clot in the right ventricle, extending into pulmonary vessels. Similar fibrinous clots also found in the left ventricle. Liver enlarged; slightly congested, but otherwise healthy looking. Kidneys healthy, Spleen enlarged and somewhat congested. Nothing abnormal in the iliac veins; the Trochanter major was splintered in two places, and the cancellated tissue infiltrated with pus.

I may not pursue this matter further, as I have already trespassed on your patience too long. If I have sufficiently illustrated my subject, I shall be satisfied, and trust that it will receive still further elaboration at the hands of some member of the Association.

Thanking you for the patience with which you have listened to me, I will no longer impose on your forbearance.